

# Speeding up the development of new materials

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People have been using metals for thousands of years and, throughout that time, they have been looking for ways to improve them. The earliest metal used by humans was copper, more than 10,000 years ago. A few thousand years later, humans began experimenting with metallurgy and created bronze, a mixture of copper and tin. The Bronze Age gave way to the Iron Age and, eventually, people began using steel, aluminum, titanium and numerous other metals in everyday life.

Today, metals have become reliable enough that they are used in everything from such simple tools as a key to open a door to far more complicated applications, such as the engine in a car. But even with how reliable these materials have become, they can still experience failure, particularly in harsh conditions.

So what about the materials exposed to some of the harshest conditions imaginable, like those inside a nuclear reactor? Reactors work by sustained fission of uranium, splitting atoms at a slow and steady rate. To create steam, temperatures inside a reactor vessel can reach up to 572 degrees Fahrenheit. Inside the nuclear fuel itself, the temperature is even higher, up to 1,832 degrees Fahrenheit. During operation of the reactor, both the fuel and the inner wall are bombarded by large amounts of radiation resulting from nuclear reactions, which makes the environment even harsher for the materials.

Read the rest of the story as it appeared in the [Albuquerque Journal](#).

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